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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ROSSI, JESSICA	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,435	COLLINS, RICHARD EDWARD	
	Examiner	Art Unit	
	Jessica L. Rossi	1733	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/1/04, Amendment*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-12 and 14-20* is/are pending in the application.

4a) Of the above claim(s) *15-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-12 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/15/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 15-20 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The process as claimed could be used to make another and materially different product such as one where formation of the hermetic seal results in direct fusing of the two glass bands to form one glass band such that two glass bands are no longer distinguishable in the final product.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 15-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Amendment

2. This action is in response to the amendment dated 11/1/04. Claims 9 and 13 were cancelled. Claims 14-20 were added. Claims 1-8, 10-12 and 14-20 are pending but claims 15-20 are withdrawn from further consideration for the reason set forth in paragraph 1 above.

3. The rejection of claims 1-2, 7-8 and 10-11 as being anticipated by Shibuya et al. (US 4269617; of record), as set forth in paragraph 4 of the previous office action, has been withdrawn in light of the present amendment; however, it is noted that the added limitations were addressed in original claim 4.

Claim Objections

4. Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of claim 1. Applicant is required to cancel the claim(s),

or amend the claim(s) to place the claim(s) in proper dependent form. Note Applicant amended claim 1 but incorporating the limitations of claim 4 therein.

Double Patenting

5. Applicant is advised that should claim 3 be found allowable, claim 14 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-2, 4, 7-8 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya et al. (US 4269617; of record) in view of the collective teachings of Miller et al. (US 5867238; of record) and Gujima et al (US 4834509; of record), and also in view of the collective teachings of Schaupert (US 5376197) and Schmitte et al. (US 4715879).

With respect to claims 1 and 4, Shibuya is directed to a method of constructing a glass panel (liquid crystal display - LCD) comprising two edge-sealed glass sheets 1, 2 (Figure 1; column 1, line 6). The reference teaches providing a solder glass band 8 around a margin of one surface of **each** glass sheet **(column 7, lines 53-56)** and forming a hermetic bond between the solder glass and the surface of each sheet by heating to a first firing temperature (Figure 1; column 3, lines 55-68; column 6, line 68 – column 7, line 1; column 7, lines 55-56). The reference teaches positioning the glass sheets in spaced-apart confronting relationship (column 4,

lines 27-29; column 7, lines 58-59) and forming a hermetic seal between the two solder glass bands by heating to a second firing temperature (column 4, lines 31-34; column 7, lines 10-11 and 60-61), which is lower than the first temperature (column 4, lines 42-46), while maintaining the spaced-apart relationship between the sheets (note spacers 3, 3' embedded within fused solder 4, 4' in Figure 1).

Although the reference does not specifically state that annealing of the glass sheets is avoided while heating to the second temperature, the skilled artisan would have appreciated that annealing would not take place during this second heating step since the reference is only heating to about 400°C for a time period of 15-45 minutes (column 7, lines 10-11; column 5, lines 11-17); it being noted that the present invention discloses heating the glass sheets up to 440°C for a time period of about 1 hour (p. 6, lines 19-23) during the second heating step without annealing the glass sheets.

Shibuya is silent as to tempering each glass sheet during the heating step that forms a hermetic bond between the solder glass band and its respective glass sheet.

It is known in the art to form an LCD comprising tempered glass sheets, as taught by the collective teachings of Miller (column 13, lines 25-26) and Gunjima (column 9, lines 41-46). Therefore, it would have been obvious to the skilled artisan at the time the invention was made to use tempered glass sheets for the LCD of Shibuya because such is known in the art, as taught by the collective teachings of Miller and Gunjima, wherein tempered glass would increase the durability and strength of the LCD.

It is known in the glass sheet art to apply a solder glass coating to the sheet and then heat the same such that fusing of the solder glass to the glass sheet and tempering of the glass sheet

both occur during this heating step, as taught by Schaupert (column 6, lines 59-65). Furthermore, the glass art has recognized the advantages of applying a coating to a glass sheet before tempering the glass sheet as opposed to tempering the glass sheet before coating, since impurities on the glass sheet surface firmly bond with the surface of the sheet due to high temperatures used in the tempering process thereby making it difficult to remove these impurities by cleaning the surface before coating and thereby affecting the quality of the coating (i.e. coating's ability to adhere to glass surface), as taught by Schmitte (column 1, line 60 – column 2, line 22; column 3, lines 3, lines 62-65; column 9, lines 7-20).

Since Shibuya teaches heating each glass sheet to a first temperature of about 430°C for about 15-45 minutes (column 6, line 68 – column 7, line 1), which is consistent with the temperatures and times at which Applicant's glass sheets are tempered (p. 6, lines 15-19), it would have been obvious to the skilled artisan at the time the invention was made to temper the glass sheets of Shibuya during the first heating step because this eliminates the need to use separate heating steps for tempering the glass sheets and hermetically bonding the solder glass to their respective sheets; especially in light of it being known in the glass sheet art to apply solder glass to the sheet and then heat the same such that fusing of the solder glass to the glass sheet and tempering of the glass sheet both occur during this heating step and also in light of the fact that a better bond will form between the solder glass and glass sheet due to the fact that tempering does not take place before the solder glass is applied to the sheet, as taught by the collective teachings of Schaupert and Schmitte.

Regarding claim 2, Shibuya teaches fusing the two solder glass bands together to form a hermetic bond directly between them (Figure 1; note spacers 3, 3' embedded within fused solder glass).

Regarding claim 7, Shibuya teaches providing the solder glass bands by depositing a liquid paste comprising solder glass powder (column 1, lines 46-48; column 4, line 64 – column 5, line 10; column 6, lines 63-64).

Regarding claim 8, Shibuya teaches depositing the solder glass by screen printing (column 6, lines 63-64).

Regarding claim 10, Shibuya does not expressly state that a spacing between the glass sheets changes during forming of the hermetic seal between the glass bands. However, the skilled artisan would have appreciated that during formation of the hermetic seal, the solder glass bands melt thereby allowing them to fuse to each other and encapsulate the spacers within (Figure 1). The skilled artisan would also have appreciated that the thickness of the glass bands placed on each glass sheet prior to formation of the hermetic seal would have to decrease somewhat during this melting, fusing, and encapsulating; therefore, the spacing between each glass sheet and the spacers upon which they rest would have to decrease, thereby resulting in a decreased spacing between the glass sheets.

Regarding claim 11, Shibuya teaches the glass sheets being flat (Figure 1).

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya et al., the collective teachings of Miller et al. and Gunjima et al. and also the collective teachings of Schaupert and Schmitte et al. as applied to claim 1 above, and further in view of Ogura et al. (US 5535030; of record).

Regarding claim 5, Applicants are directed to paragraph 7 above for a complete discussion of Shibuya. The reference teaches spacers 3, 3' maintaining the glass sheets in the spaced apart relationship, but is silent as to the spacers being pillars. Selection of a particular shape for the spacers would have been within purview of the skilled artisan at the time the invention was made. However, it would have been obvious to use pillars because such is known in the LCD art, as taught by Ogura (Figure 1).

Regarding claim 6, Applicants are directed to paragraph 7 above for a complete discussion of Shibuya. Shibuya is silent as to evacuating the space between the sealed glass sheets. It would have been obvious to evacuate the space between the sealed sheets forming the LCD of Shibuya because such is a well known and conventional process step in the LCD art, as taught by Ogura (column 6, lines 2-6), thereby allowing for injection of the liquid crystal display material while avoiding air bubble formation.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya et al., the collective teachings of Miller et al. and Gunjima et al. and also the collective teachings of Schaupert and Schmitte et al. as applied to claim 1 above, and further in view of Bayer (US 3886014; of record).

Regarding claim 12, Applicants are directed to paragraph 7 above for a complete discussion of Shibuya. Shibuya is silent as to the glass sheets being curved.

Selection of a particular shape for the glass sheets would have been within purview of the skilled artisan depending on the type of product the LCD is to be incorporated into (i.e. watch, tv screen, etc.). However, it would have been obvious to use curved glass sheets for the LCD of

Shibuya because such is known in the art, as taught by Bayer (Figure 11; column 5, lines 1-2 and 6).

10. Claims 1, 3-8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dalton (US 2643020; provided in IDS) in view of Veres (US 2936923; provided in IDS) and the collective teachings of Schaupert and Schmitte et al.

With respect to claims 1, 3-4 and 14, Dalton is directed to a method of constructing a variety of glass articles, including a glass panel which comprises two confronting edge sealed tempered glass sheets (Figures 5-6; column 5, lines 55-57 and 67-67; column 8, lines 4-13). The reference overcomes the problems associated with the prior art process of directly fusing two glass parts to each other by using solder glass, which has a lower softening temperature than the glass parts, to form a hermetic seal between the glass sheets during heating of the glass sheets without annealing the same, thereby making it possible to use tempered glass sheets without releasing the stresses therein (column 1, lines 54-56; column 3, lines 25-35; column 7, lines 45-49; column 8, lines 8-13).

The reference is silent as to providing a solder glass band around the margin of one surface of each glass sheet, heating the glass sheets to a first temperature to temper each sheet and bond its associated solder glass thereto, and heating the glass sheets to a second lower temperature to form a hermetic seal between the two solder glass bands.

It is noted that a cathode ray tube is one of the variety of glass articles made using the process of Dalton (Figure 3; column 5, lines 50-51). Veres, directed to making a cathode ray tube, also appreciated the advantages of using solder glass to bond two glass parts as opposed to directly fusing them together; however, this reference further recognized the drawbacks

associated with using a single solder glass, which include a joint having localized and uncontrolled areas of excessive stress and the need for extensive grinding and polishing of the glass parts in order to produce suitable mating surfaces so as to avoid squeezing out of the solder glass during sealing and vacuumizing (column 1, lines 15-43).

Veres eliminated these drawbacks by using a combination of a higher-melting solder glass and a lower-melting solder glass. In the embodiment of Figure 3, the reference teaches providing a lower-melting solder glass band 14 around a margin of one surface of each glass part, heating the glass parts to a first temperature to form a hermetic bond with the solder glass band and its respective part, positioning the parts in spaced-apart confronting relationship with a higher-melting solder glass 15 interposed between the two solder glass bands 14, and heating the glass parts to a second temperature lower than the first to fuse the solder glass 15 with the solder glass bands 14 thereby forming a hermetic seal between the two solder glass bands 14 while avoiding annealing of the glass parts and while maintaining the spaced-apart relationship between the parts (Figure 3; column 3, lines 16-75).

Therefore, it would have been obvious to the skilled artisan at the time of the invention to use the lower-melting solder glass bands and higher-melting solder glass of Veres to bond the glass sheets comprising the panel of Dalton wherein the method steps of Veres detailed in the previous paragraph are used to carry out the bonding process because this eliminates the previously mentioned drawbacks associated with using a single solder glass.

As previously stated, Dalton teaches the glass sheets being tempered but is silent as to when this tempering takes place (column 8, lines 10-13). It is known in the glass sheet art to apply a solder glass coating to the sheet and then heat the same such that fusing of the solder

glass to the glass sheet and tempering of the glass sheet both occur during this heating step, as taught by Schaupert (column 6, lines 59-65). Furthermore, the glass art has recognized the advantages of applying a coating to a glass sheet before tempering the glass sheet as opposed to tempering the glass sheet before coating, since impurities on the glass sheet surface firmly bond with the surface of the sheet due to high temperatures used in the tempering process thereby making it difficult to remove these impurities by cleaning the surface before coating and thereby affecting the quality of the coating (i.e. coating's ability to adhere to glass surface), as taught by Schmitte (column 1, line 60 – column 2, line 22; column 3, lines 3, lines 62-65; column 9, lines 7-20).

Since Dalton in view of Veres teaches heating each glass sheet to a first temperature below about 537°C (= 1000°F; column 3, lines 25-42), wherein the skilled artisan would have appreciated such temperatures being sufficient for tempering glass, it would have been obvious to the skilled artisan at the time the invention was made to temper the glass sheets of Dalton during the first heating step because this eliminates the need to use separate heating steps for tempering the glass sheets and hermetically bonding the solder glass to their respective sheets; especially in light of it being known in the glass sheet art to apply solder glass to the sheet and then heat the same such that fusing of the solder glass to the glass sheet and tempering of the glass sheet both occur during this heating step and also in light of the fact that a better bond will form between the solder glass and glass sheet due to the fact that tempering does not take place before the solder glass is applied to the sheet, as taught by the collective teachings of Schaupert and Schmitte.

Regarding claim 5, Dalton teaches a double window pane being one of the variety of glass articles made using the disclosed process wherein support pillars 37 are used to maintain the glass sheets in spaced-apart relationship (Figure 6; column 5, lines 55-58).

Regarding claim 6, the skilled artisan would have readily appreciated it being well known and conventional to evacuate the space between two panes of glass forming a window in order to improve the insulation properties of the window.

Regarding claim 7, Dalton teaches applying solder glass in a variety of forms, including liquid paste (column 4, lines 35-41).

Regarding claim 8, Dalton teaches depositing the solder glass using a variety of techniques (column 4, lines 35-42) not critical to the invention; therefore, the skilled artisan would have been motivated to use any conventional technique, such as screen printing, because only the expected results would have been achieved.

Regarding claim 10, the skilled artisan would also have appreciated that the thickness of the glass bands placed on each glass sheet prior to formation of the hermetic seal would have to decrease somewhat during melting and fusing; therefore, the spacing between each glass sheet and the spacers upon which they rest would have to decrease, thereby resulting in a decreased spacing between the glass sheets.

Regarding claim 11, Dalton teaches such (Figures 5-6).

Regarding claim 12, whether to use flat or curved sheets for the variety of glass panels taught by Dalton would have been within purview of the skilled artisan; it being noted that curved window panes are known in the art.

Response to Arguments

11. Applicant's arguments filed 11/1/04 have been fully considered but they are not persuasive.

12. On page 5 of the arguments, Applicant argues that Shibuya would not be concerned with a glass panel comprising tempered sheets as it is not an issue for a liquid crystal display element.

As set forth in paragraph 7 above, using tempered glass sheets to form a liquid crystal display element is well known in the art, as taught by Miller and Gunjima, wherein tempered sheets impart strength to the liquid crystal display element; therefore, Shibuya would be motivated to make the liquid crystal display element using tempered glass sheets for this reason.

13. On pages 5-6 of the arguments, Applicant argues that a person skilled in the field of glass paneling for windows, doors, etc. would not consider the Shibuya process of manufacturing liquid crystal display elements as relevant to the method of the present invention.

The examiner points out that the present claims only state a method of constructing a glass panel. Therefore, "glass panel" has been given its broadest interpretation wherein the LCD element of Shibuya, which if formed by bonding two glass sheets using solder glass bands, clearly reads on Applicant's "glass panel." As for Applicant's argument pertaining to windows, doors, etc. – such is not commensurate with the scope of the claimed invention.

14. On page 6 of the arguments, Applicant argues that Shibuya did not disclose or suggest to form the glass panels comprising tempered glass sheets wherein each glass sheet's tempering characteristics were maintained after formation of the hermetic seal.

Applicant is invited to reread paragraph 7 above. To reiterate, Shibuya does not specifically state that annealing of the glass sheets is avoided while heating to the second temperature; however, the skilled artisan would have appreciated that annealing would not take

place during this second heating step since the reference is only heating to about 400°C for a time period of 15-45 minutes (column 7, lines 10-11; column 5, lines 11-17); it being noted that the present invention discloses heating the glass sheets up to 440°C for a time period of about 1 hour (p. 6, lines 19-23) during the second heating step without annealing the glass sheets.

15. On page 6 of the arguments, Applicant argues that although Miller and Gunjima teach an LCD made from tempered glass, none of them alone or in combination with Shibuya teach simultaneously tempering each sheet and bonding it to the glass band.

The examiner agrees that such is not expressly taught by these references. However, as set forth in paragraph 7 above, the references to Schaupert and Schmitte have been added to collectively show it being known and to provide motivation for simultaneously fusing solder glass to a glass substrate while tempering the glass substrate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jessica L. Rossi** whose telephone number is **571-272-1223**. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine R. Copenheaver can be reached on 571-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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